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FY 2004 President's Request

Climate Change Research Initiative

Overview

Addresses

NOAA Mission Goal #2

Understand climate variability and change to enhance society's ability to plan and respond

What is requested?

NOAA requests an increase of $16.9 million and 8 FTE, $13.4 million in the Operations, Research, and Facilities (ORF) account and $3.5 million in the Procurement, Acquisitions, and Construction (PAC) account to work towards the goals of the Climate Change Research Initiative (CCRI). The President announced the CCRI in June 2001 to address areas of uncertainty in climate change science and identify priority areas where investments can make a difference. He committed to providing resources to build climate observation systems and proposed an international joint venture to develop state-of-the-art climate modeling that will improve our understanding of climate change and its potential impacts. This budget request represents the second year of the President's program.

Why do we need it?

The possible economic impact of mitigating human-induced climate change could be large. Decisions must be based on the best science and the most up-to-date tools. This request specifically targets fundamental areas of scientific uncertainty identified by the National Academy of Sciences. The increase will provide a broad-scale look at the climate system, help us determine uncertainties in predicting climate system behavior, reveal the regional impacts of climate change, and allow NOAA to analyze key scenarios for policy-makers. The proposed actions aim to reduce the present uncertainties in climate science, develop modeling capabilities, and create research and data products that facilitate the use of scientific research in policy and management decisions.

What will we do?

This request supports improvement of our predictive and observational capabilities in several key areas. NOAA will continue to build and sustain a **Global Ocean Observing System** (+$6.3M) that accurately documents climate-scale changes in ocean heat, carbon, and sea level. The ocean is the memory of the climate system and is second only to the sun in affecting seasonal variability and long-term climate change. The key to possible abrupt climate change may lie in deep-ocean circulation, and changing sea level is one of the most immediate impacts of climate change. More oceanic data, collected at finer resolutions, will allow us to document long-term trends in sea-level change, determine ocean carbon sources and sinks, measure oceanic heat uptake and release, and help lead to better models. Among other additions with its partners, NOAA will add 10 tide gauges, 240 surface drifting buoys, 4 tropical moored buoys, and devote an extra

Climate Change Research Initiative At-a-Glance

What: $16.9M increase

Why: Reducing climate uncertainties will allow society to better respond and adapt to climate change and variability.

60 days of ship time. The request will bring to completion approximately 48% of the ocean observing system currently under construction. NOAA will support the implementation of a **Carbon Cycle Atmospheric Observing System** (+$5.0M) to begin defining carbon dioxide sources and sinks in and around the U.S. in order to gauge the effectiveness of future carbon emission and sequestration strategies. Carbon dioxide is considered the most important "excess" (anthropogenic) greenhouse gas. There is a compelling need to quantify its uptake by the land and ocean. Advances in carbon measurement and understanding will support products such as cutting-edge "maps" of carbon dioxide uptake over North America and adjacent ocean basins, routine projections of carbon sources and sinks into the future, and assessment of carbon management options. **Climate Change Uncertainties Caused by Aerosols** (+$1.0M) will be another CCRI topic NOAA will investigate. Aerosols are small particulates that remain in the atmosphere for short durations yet significantly influence climate by absorbing and radiating heat. NOAA will measure the distribution of soot and related aerosols, develop models to link sources and emissions to observations, and improve satellite algorithms. The work will lead to scientific information that decision-makers can use to make short-term policies and help clarify the connections between climate and air quality. NOAA will establish the **Climate Change Science Program Office** (+$1.1M) to support our Nation's interagency climate and global change program. The Department of Commerce, as the lead agency for the CCRI, will establish the office with broad physical and social science capabilities to ensure that the benefits of scientific research are applied to climate change policy issues and decision support. The effort will enable coordinated programmatic decisions for the CCRI, and support direct application of science products such as climate scenarios and carbon source/sink distributions to such questions as alternative energy strategies, climate change adaptations, and ranges of emissions scenarios. Finally, NOAA's **Climate Change Computing Initiative** (+$3.5M in PAC account) will: (1) enhance the Geophysical Fluid Dynamics Laboratory's supercomputing capability by 1/3 to enable the running of computer model simulations relevant to policy and business issues and (2) turn NOAA's investments in the CCRI and previous research into policy-relevant knowledge. The new computing power will be used to explore specific scenarios that go beyond those produced by the Intergovernmental Panel on Climate Change (IPCC) and will be designed to answer questions asked directly by policy-makers.

What are the benefits?

In addition to the specific benefits outlined above, NOAA will be better positioned to: (1) reduce climate-change uncertainties with major advances in understanding and modeling of greenhouse gases and aerosols; (2) ensure the existence of a long-term observing system that provides a more definitive observational foundation to evaluate decadal-to-centennial scale changes; (3) enhance research by coupling physical, chemical, biological, and human systems; and (4) improve the effectiveness of decision support systems and analysis of the response of human and natural systems to multiple stresses. Simply put, CCRI will provide us with a suite of decision tools to better address the issue of climate change and variability.

For more information:

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FY 2004 Proposed Climate Change Research Initiative Program Components:

- Global Ocean Observing System
- Carbon Cycle Atmospheric Observing System
- Aerosols
- Climate Change Science Program Office
- Climate Change Computing Initiative

Office of Oceanic and Atmospheric Research
Climate Research

Procurement, Acquisition, and Construction
Research Supercomputing/

NOAA Budget FY 2004 Change
Climate Change Research Initiative
$13.4M
CC Computing
$3.5M